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A NEW BALANSIA ON CYPERUS

C. W. EDGERTON

(WITH PLATE 12)

During the summer of 1917, an interesting species of *Balansia* was found attacking the fruiting parts of *Cyperus virens*. The fungus seemed to be of special interest as the described species of this genus are mostly listed as occurring on grasses. The region in which the specimens were found consisted of a low swampy sedge meadow in which *Cyperus virens* made up a considerable portion of the plant population. A large portion of the sedge plants of this species were attacked by the fungus. The fungus formed large black sclerotia in place of the fruiting parts, and as *Cyperus virens* is one of the very large sedges, diseased plants were very conspicuous. Specimens in all stages of development were found in abundance.

Cyperus virens develops in large stools often with fifteen to twenty or more flower stalks and it was interesting to note that a stool was either entirely healthy or else all of the flower stalks were diseased. Although a careful search was made, no stools were found which contained both healthy and diseased flower clusters. This held true even though the stools were touching each other or were interlaced. This seemed to show that the infection must have occurred very early in the development of the host plant or else the mycelium of the fungus was perennial.

The fungus is easily demonstrated in the very young flower buds. The young bud which would normally develop into a whole flower cluster is at first enclosed by the large leaves. A bud from a diseased stool has the appearance of being perfectly healthy, yet a cross section shows the mycelium to be abundant between the different parts. The host cells, however, do not appear to be injured in these very small buds. Buds were examined that were less than two millimeters in diameter.

The fungus sclerotium develops as the bud enlarges and emerges from the covering leaves. The mycelium develops within the bud and also forms a white layer over the outside (Fig. 1). On this white layer the conidial stage of the fungus develops. The short and narrow conidiophores form a very dense layer from forty to fifty microns thick over the surface of the sclerotium. The small hyaline conidia develop very abundantly often collecting in mucilaginous drops on the surface.

Following the conidial stage, the sclerotium continues to increase in size, turns black in color, and the exterior mycelial layer increases in thickness. The mature sclerotium (Fig. 3) consists of a mass of small nodules each representing one of the stems of the flower cluster. Sometimes these nodules are more or less separate but generally they are all cemented together in one mass. Frequently on drying, these separate to some extent. The interior of the sclerotium is typical of this genus, it being composed of both fungous and host tissues.

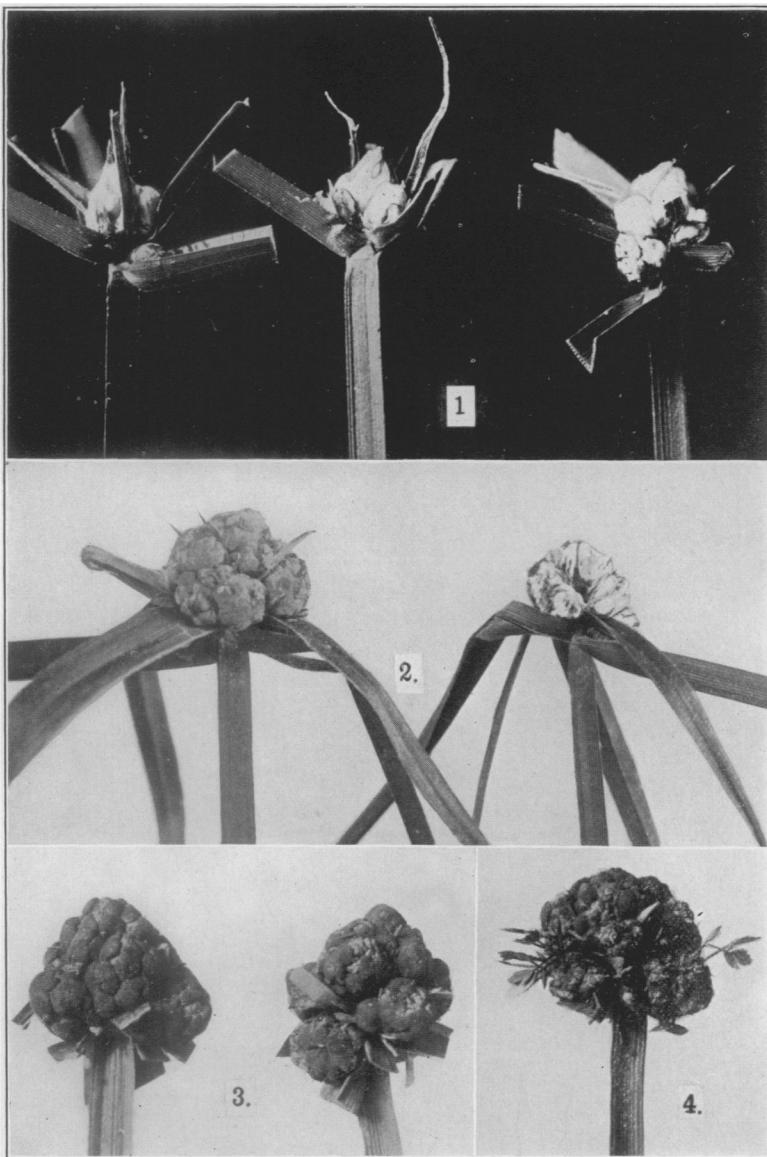
The perithecia of the fungus form in the black outer layer of the mature sclerotium. They are embedded in the tissue with only the ostioles extending slightly above the surface. The ascus has the peculiar bulbous apex found in other species of this genus.

Very seldom is there any development of the parts of the flower cluster of infected plants, though occasionally a stalk or two will push out of the sclerotium for a short distance and form rudimentary spikelets (Fig. 4). Sometimes when this happens, a secondary sclerotium will develop on this branch.

Specimens of this fungus were sent to the late Professor G. F. Atkinson, who had made considerable study of this genus, and he stated that it was undoubtedly an undescribed species. The technical description of the fungus follows.

Balansia cyperi sp. nov.

Sclerotium made up of fungous and host elements, developing in the flower cluster; sometimes one for each branch of the cluster but generally a large, compound, nodose sclerotium in place of the whole flower cluster; slightly stipitate or sessile, 1-3 cm. in diameter, white to greyish in color during early development, but black, hard and papillate at maturity. Conidia developing on



BALANSIA CYPERI EDGERTON

short narrow, crowded conidiophores on the white immature sclerotia, straight or slightly curved, long, narrow, sharp pointed, hyaline, $15-30 \times 1-1.8 \mu$. Perithecia flask shaped with a somewhat thickened elongate neck extending to the surface of the sclerotium, $480-600 \times 120-200 \mu$. Ascii long, narrow, usually straight but sometimes curved, $160-225 \times 7-10 \mu$. Ascospores long, narrow, hyaline, septate, $100-200 \times 1.5-2 \mu$.

In fruiting parts of *Cyperus virens*, St. Gabriel, Louisiana, August 16, 1917, collected by A. T. Bell and C. W. Edgerton.

Type material in Herbarium of the New York Botanical Garden. Specimens also in Bureau of Plant Industry collections, Washington, D. C.

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EXPLANATION OF PLATE 12

Balansia cyperi on *Cyperus virens*

Fig. 1. Young immature sclerotia with conidial stage.

Fig. 2. Older stage of sclerotia.

Fig. 3. Mature sclerotia with perithecial stage.

Fig. 4. Mature sclerotium with rudimentary spikelets of the host plant.